Version 11.6	1-Aug-16										

DoD Manufacturing Readiness Levels (MRLs)

Acquisition Phase		Pre Materiel Solution Analysis (Pre MSA)			Materiel Solution Analysis (MSA)	Technology Maturation and Risk Reduction (TMRR)		Engineering & Manufacturing Development (EMD)		Low-Rate Initial Production (LRIP)	Full-Rate Production (FRP)
Technical Reviews					ASR A	SRR/SFR	PDR B	CDR	PRR/SVR C	PCA FRP	
Thread	**Sub-Thread**	**MRL 1**	**MRL 2**	**MRL 3**	**MRL 4**	**MRL 5**	**MRL 6**	**MRL 7**	**MRL 8**	**MRL 9**	**MRL 10**
	Technology Maturity	Should be assessed at TRL 1.	Should be assessed at TRL 2.	Should be assessed at TRL 3.	Should be assessed at TRL 4.	Should be assessed at TRL 5.	Should be assessed at TRL 6.	Should be assessed at TRL 7	Should be assessed at TRL 7 or TRL 8.	Should be assessed at TRL 8 or TRL 9.	Should be assessed at TRL 9.
D - Materials (Raw Materials, Components, Sub-assemblies and Sub-systems)	D.4 - Special Handling (i.e. Government Furnished Property (GFP), shelf life, security, hazardous materials, storage environment, ESH, etc.)		Initial evaluation of potential regulatory requirements and special handling concerns.	List of hazardous materials identified and alternatives evaluated. Special handling procedures, including environmental, safety, and health, applied in the lab with established disposal procedures. Special handling concerns assessed.	List of hazardous materials updated and alternatives assessed. Special handling procedures, including environmental, safety, and health, applied in the lab and disposal procedures evaluated. Special handling requirements identified and analyzed.	Special handling procedures, including environmental, safety, and health, applied in production relevant environment. Special handling requirement gaps identified. New special handling processes demonstrated in lab environment. Waste stream (disposal/recycle) analysis initiated.	Special handling procedures, including environmental, safety, and health, applied in production relevant environment. Plans to address special handling requirement gaps complete. Manufacturing assessed for material storage and waste handling risks.	Special handling procedures, including environmental, safety, and health, applied in production representative environment. Special handling procedures developed and annotated on work instructions for pilot line. Hazardous material storage and disposal plan in place for the pilot line.	Special handling procedures, including environmental, safety, and health, applied in pilot line environment. Special handling procedures demonstrated in EMD or Technology Insertion Programs. Special handling issues pose no significant risk for LRIP. All work instructions contain special handling provisions as required. Hazardous material storage and disposal plan evaluated and in place for LRIP.	Special handling procedures, including environmental, safety, and health, applied in LRIP environment. Special handling and hazardous material storage and disposal procedures demonstrated in LRIP. Special handling and hazardous material storage and disposal issues pose no significant risk for FRP.	Special handling procedures, including environmental, safety, and health, effectively implemented in FRP.
H - Facilities	H.2 - Facilities			Specialized facility requirements/needs identified.	Availability of manufacturing facilities for prototype development and production evaluated as part of AoA. Human Factors & Ergonomics /Safety requirements identified and assessed for manufacturing personnel.	Manufacturing facilities identified and plans developed to produce prototypes. Human Factors & Ergonomics /Safety requirements identified and assessed for manufacturing personnel.	Manufacturing facilities identified and plans developed to produce pilot line build. Human Factors & Ergonomics /Safety requirements verified in a production relevant environment for manufacturing personnel.	Manufacturing facilities identified and plans developed to produce LRIP build. Human Factors & Ergonomics /Safety practices validated in a production relevant environment for manufacturing personnel.	Pilot line facilities demonstrated. Manufacturing facilities adequate to begin LRIP. Plans in place to support transition to FRP. Workplace safety is adequate. Human Factors & Ergonomics /Safety practices demonstrated on a pilot line for manufacturing personnel.	Manufacturing facilities in place and demonstrated in LRIP. Capacity plans adequate to support FRP. Human Factors & Ergonomics /Safety practices demonstrated in LRIP for manufacturing personnel.	Production facilities in place and capacity demonstrated to meet maximum FRP requirements. Human Factors & Ergonomics /Safety requirements demonstrated in FRP and updated for manufacturing personnel.